LIBRARY

NUMBER 2



Morris

ARBORETUM BULLETIN

MAY, 1956

VOL. 7



Ivies Along Oak Row

Published by The ASSOCIATES of THE MORRIS ARBORETUM

THE MORRIS ARBORETUM OF THE UNIVERSITY OF PENNSYLVANIA

Maintained by THE MORRIS FOUNDATION

ADVISORY BOARD OF MANAGERS Gaylord P. Harnwell, Chairman

William M. David John B. Kelly Charles J. Seltzer, Jr. Wharton Sinkler

Maurice Bower Saul, Counsel

MEMBERS OF THE STAFF John M. Fogg, Jr., Director

Janet L. Bowen,

Administrative Assistant

Hui-Lin Li, Taxonomist

Martha H. Starr, Propagator

John Tonkin, Superintendent James O'Neil, Custodian Fred W. Schwoebel,

Curator of the Langstroth Bee Garden

The Morris Arboretum Bulletin is published quarterly at Philadelphia, Pa., by the Associates of the Morris Arboretum, Chestnut Hill, Philadelphia 18. Subscription, \$1.00 for four issues. Single copies, 30 cents. Free to Associates.

THE ASSOCIATES, through whose interest and generosity *The Bulletin* and certain other undertakings of the Arboretum are made possible, is an informal group of individuals interested in encouraging and furthering the educational and research endeavors of the Morris Arboretum.

CLASS OF MEMBERSHIP

Contributing \$ 5.00 a year Sustaining \$10.00 a year	
Donor	\$500.00

Arboretum Activities

The winter of 1955-56 has been an unusually severe one at the Arboretum. The prolonged drought of last July and August and the heavy rainfall of early autumn were followed by cold weather, high winds and frequent snowfalls which began early in November and continued until mid-April. Although it is too soon to assess the damage which this combination of unfavorable conditions imposed upon our plantings, most of our major groups seem to have survived remarkably well. A future issue of the Bulletin will carry a detailed report on this situation.

NEW AZALEA PLANTING

Several beds have been laid out for a new azalea planting in the southeastern corner of the property along Hillcrest Avenue. Into these beds are being moved 175 azaleas which have been held under observation in our nurseries for a number of years. Most of these are Glenn Dale hybrids ranging in color from pure white through lavender to various shades of pinks and reds. The series also includes several hybrids of Chisholm, Merritt, Arnold, Bobbink and Atkins, Gable and

(Continued on page 32)

The Cultivated Ivies

GEORGE H. M. LAWRENCE
Bailey Hortorium, Cornell University, Ithaca, N.Y.

Few plants are so well suited to such a wide range of horticultural use as the English ivy and its relatives. This quality is due to two principle factors. The first is the unusual situation of a hardy woody plant having a juvenile phase of growth, with its characteristic vine-like habit and usually lobed leaves, and followed under favorable conditions by an adult phase with a stiff shrublike habit and entire heart-shaped leaves. The second is its capacity to produce bud sports or mutations while in the juvenile phase, - these being cut off and propogated as new foliage variants. The number that have been named and put on the market exceeds two hundred. Only two or three sports have been found and separated from the adult-phase. Other factors that have contributed to the popularity of this group are its ease of culture in the home as a foliage plant, its suitability in most temperate regions as a ground- and wallcover outdoors, and the ease with which it may be propagated by cuttings.

The outdoor culture and display of the named kinds of ivy is made difficult because of the labor involved in training the plants and keeping separate the growth of adjoining clones. This difficulty has been resolved at the Morris Arboretum by growing each kind on separate trees of a very beautiful double row of oaks. This collection, started there in 1945, is the best outdoor display of ivy clones known to me anywhere in this coun-

try or in Europe.

len

ortes.

ner

ted

m.

ear

ear

ew

the

eds

een

ale

igh

The

m.

nd

Ivies became very popular in Britain a century ago and by 1870 more than 70 named varieties were known. The plants of that era were grown primarily outdoors. Their popularity in America trailed that in Britain until the 1920's, when the introduction of the Ramosa strain of proliferating forms, first represented by 'Pittsburgh,' came on the market. By the mid-1930's the growing of ivies in the home and the naming of newly recognized sports reached fad-like proportions. Since then there has been some reduction of interest in them, as other foliage plants have competed successfully for attention, but with this there has been a levelling-off and a stabilizing in the number and kinds of named variants. The only comprehensive horticultural monograph of modern ivies is that by Lawrence and Schulze "The Cultivated Hed-eras" (Gentes Herbarum, 6: 106-173, 1942), now out-of-print and to be consulted only at the larger botanical libraries.

¹ See cover illustration by Dr. E. J. Schreiner.

Since 1942, more information has become available about these varieties, their hardiness, and their decorative limitations. Of significant importance also, has been the effect of the relatively new International Code of Nomenclature for Cultivated Plants on the naming of clones. The demands for information about the kinds of cultivated ivies have prompted the preparation and publication of this material. Much of the technical descriptive and nomenclatural data of the Lawrence and Schulze monograph have been omitted, including their extensive citation of synonyms and notes on introduction. Some of the illustrations of that work have been made available for inclusion here, and the keys reproduced here are based on those of the earlier work.

Prior to 1952, persons concerned with the nomenclature of cultivated plants followed the International Code of Botanical Nomenclature, a Code adequate for the botanist but less so for the horticulturist. With the adoption at the London Horticultural Congress in 1952 of an International Code for Cultivated Plants, a new guide was made available that is destined to produce greater uniformity in naming garden plants. This Code is based on all the principles of the botanical code and, in effect, carries on for the horticulturist where the other leaves off. There is complete harmony be-

tween the two.

It is useful to know how this Code affects the naming of ivies. In the first place, it differentiates between the wild plant the botanist designates as a variety and that which the gardener calls a variety. The differences between the two are largely genetical and have been reviewed in detail elsewhere (Baileya, vol. 3, pp. 177-181, Dec. 1955). In order to recognize the horticulturist's variety, the Code provides for its being called a cultivar (a condensation of 'cultivated variety,' a term proposed by L. H. Bailey in 1921). It is abbreviated as cv. Furthermore, the cultivar name, whether it be in Latin (e.g., grandiflora) or in a modern language (e.g., Pittsburgh) is to be treated as a vernacular name, enclosed in single quotation marks, and spelled with a capital initial (e.g., Hedera Helix cv. Walthamensis' and cv. 'Hahn's Self-branching').

Plants that must be propagated asexually (such as by grafting, budding, cuttings, and layering) are clones. Each clone is identical to the plant from which it was cut, unless mutation has occurred within a bud. The clone is a subdivision of a cultivar. If seed is sown from some cultivars, espe-

cially those of hybrid origin, the progeny may be very variable. Selections of desirable seedlings may be named individually and a stock of them be built up by asexual propagation. Thus one cultivar may give rise to many clones. The fancy-named ivies actually are clones. The Code provides that when a plant is always handled as a clone, the designator cl. may be used in place of cv. This device tells anyone that the plant must be propagated asexually

if trueness to name is to be assured.

The Botanical Code requires that the first publication of all new varieties given Latin names must have the new name accompanied by a Latin description. This becomes absurd for new names of horticultural plants, and the Horticultural Code requires only that the name be in any modern language using the Roman alphabet and be accompanied by a description in such a language. The segregation of cultivars from varieties makes this simplification possible. A cultivar (or clonal) name may be published in any widely distributed printed periodical, catalogue or book, or in the registration lists of societies acting as official registrars for particular groups. The Code does require, however, that the name be accompanied by a description of the plant concerned. Publication of an illustration, without description, does not meet these requirements.

The nomenclature for species of Hedera, and for botanical varieties (e.g., H. Helix var. baltica) must continue to be in accordance with the Botanical Code. There have been no changes in recent editions of this Code that affect established names

of Hedera species.

Five species of Hedera are in cultivation. Most of them are known to horticulturists only by their juvenile foliage and one of the best vegetative characters for the separation of the species is the type of hairs they bear. These hairs are small. Often they are like fringed scales that lie appressed to the epidermis. A good hand-lens is needed to distinguish the kinds and one should look first at twig-tips and leaf-petioles or under side of the leaf-blades when seeking these hairs. If the hairs are so dense as to present a mat-like surface, one should follow the stem back towards the older parts, where the abundance of hairs is much less. Illustrations of these hair types are provided. The key provided to the species is based on the vinelike often climbing juvenile growth phase. The clones are keyed out separately under their respective species.

In keying out these ivies, a minimum of terminology is required and most of it refers to the leaves. Those of the juvenile stage are variously lobed. The central lobe towards the tip is the terminal lobe. The two lobes formed by the more or less heart-shaped base are the basal lobes; these are sometimes small and likely to be overlooked. In a

five-or-more lobed leaf the lobes between the terminal and basal lobe are called lateral lobes. The space or opening between two adjacent lobes is a sinus. In Hedera these sinuses may be rounded or angular. A rounded sinus is one whose base is obtuse and, conversely, an angular sinus is one whose base is sharp-pointed or essentially so. By geometrical definition, an angle greater than a



Hedera nepalensis. A, juvenile foliage x 1/2; B, scale-like hair x 40.

right angle is obtuse, one less than a right angle is acute. Thus one may have an ivy leaf with rounded sinuses and the lateral veins forming acute angles with the midrib. Figures indicating leaf size are of the leaf-blade exclusive of its petiole. They are of the entire blade, including its basal lobes and not of the midrib only.

d



Fig. 6. Hedera colchica. A, var. colchica, juvenile foliage × ½; B, var. dentata, leaf, × ½; C, cl. 'Dentato-variegata' × ½; D, scale-like hairs × 25.

Caution: when keying out any ivies, especially the clones, it is essential to have at hand a twig bearing 8-12 leaves. It is not usually possible to identify an ivy clone on the basis of a single leaf. The variation between leaves may be considerable in some clones, and one must then be guided by characters as shown by the majority of the leaves of a twig.

KEY TO THE SPECIES OF HEDERA

- Hairs mostly scale-like, flat against the surface and not stalked, rays 8-30. (Fig. 7-E.)
 - On upper surface; the hairs of two kinds intermixed, some scale-like and flattened and a few stellate and stalked; twigs and petioles usually burgundy-red (green in two clones each with leaves variegated). 3. H. canariensis
 - 2. Leaf-blade leathery, often dull on upper surface; the hairs all scale-like; twigs and petioles
 - 3. Blades of leaves ovate with broadly wedgeshaped, heart-shaped bases, having strong celery-like odor when crushed; hairs mostly with 20-25 rays (Fig. 6-D) . . 2. H. colchica
 - 3. Blades of leaves usually elliptic-lanceolate with cuneate base, not at all or only slightly odoriferous when crushed; hairs having mostly 15-20 rays. (Figs. 5-B, 8-B.)
 - 4. Leaves much longer than wide, (usually 1-4 in. long), entire or only slightly lobed; fruit orange 1. H. nepalensis
 - Leaves not much longer than wide, (usually 5/8-11/2 in. long), 3-5-lobed in juvenile stage; fruit black....4. H. rhombea
- Hedera nepalensis K. Koch. [Syn. Hedera himalaica (Hibb.) Tobler, H. cinerea (Hibb.) Bean]. (Fig. 5.) Nepal Ivy.
- This is an Asiatic species to be found native from Afghanistan to Kashmir, Nepal, and Assam. It is readily distinguished in the juvenile stage by its elliptic-lanceolate leaves of a dull green color mottled with small interstitial zones of gray-green between the lateral veins, and by the 2-4 narrow lobes on each side. The marigold-yellow fruits are distinctive when available. The Poets ivy (rare in U.S. A.), a botanical variety of *H. Helix*, also produces yellow fruits, but is readily distinguished by its foliage and hair type.
- Hedera colchica K. Koch [Syn. Hedera cordifolia Hibb., H. coriacea Hibb., H. Helix Raegneriana Nicholson]. (Fig. 6.) COLCHIS IVY.
- A species native throughout much of the forest area of southeastern Europe and Asia Minor to northern Iran and Turkey. It is easily identified by its thick leathery leaves of dull dark green color which emit a celery-like odor when crushed. It is reasonably hardy and can be grown in Rehder's hardiness Zone 5. Two variants are known in addition to the typical.
- Leaves with entire margins var. colchica
 Leaves with weakly and often sparsely toothed
- margins.

 2. Foliage uniformly green in color

2. Foliage variegated ivory, to cream-color, at least marginally.....cl. 'Dentato-variegata' Var. dentata, sometimes known as BULLOCKS-HEART IVY, is native in the Province of Batum, or the Planck Sea discipline.

the Black Sea, adjoining Turkey. Material passing in the trade as *H. colchica minor* is *H. Helix* cl.

'Scutifolia Minor.'

 Hedera canariensis Willd. [Syn. H. algeriensis Hibb., H. maderensis K. Koch, H. azorica, Carr.] (Fig. 7.) ALGERIAN IVY.

A native of the Azores, Canary and Madeira Islands, and North Africa, this species and its variants are more commonly cultivated than any other except the English ivy, H. Helix. It is hardy in Rehder's Zone 6, and in favored locations of Zone 5. Most of the large-leaved variegated ivies of the dime-store and florists' shop trade are of this species, and it is grown abundantly outdoors along the West Coast.

The species is the only one producing bright burgundy-red twigs and leaf-petioles. Its thin leaves are large, glossy, and more apple-green in color than are those of other species. It is closely related to *Hedera Helix* and in its adult stage is not so easily distinguished as are other species.

KEY TO THE HORTICULTURAL CLONES

1. Plants with uniformly green leaves; twigs and petioles burgundy-redvar. canariensis

Plants with variously variegated leaves.
 Twigs and petioles green.

 Leaves uniformly variegated with ivory to cream-colored margins, occasionally some leaves all white. cl. 'Canary Cream'

Petioles and usually the twigs burgundy-red; leaves various.

4. Leaves dark green marginally; mid-section of blade streaked with light green or ivory.

4. Leaves cream-colored or ivory variegated along margin, usually broadly so; mid-section greenish.

5. Margins cream- or ivory-color; midsection usually a blue- or gray-green [Syn. 'Gloire-de-marengo'].

 Hedera rhombea (Miq.) Bean [Syn. Hedera Helix var. rhombea Miq., H. japonica Paul not Jungh., H. Tobleri Nakai]. (Fig. 8.) JAPANESE IVY.



Fig. 7. Hedera canariensis. A, var. canariensis × ½; B, cl. 'Variegata' × ½; C, cl. 'Striata' × ½; D, cl. 'Margino-maculata' × ½; E, scale-like hair × 25.



Fig. 8. Hedera rhombea. A, juvenile foliage x 1; B, hair x 40.

, cl. 25. This ivy is strictly a Japanese native, occurring on most of the islands except the northern island of Hokkaido.

It is separated from the Nepal ivy by the very broadly ovate juvenile leaves which are 3-5-lobed, and from the Colchis ivy by the lobing of the leaves and the absence of a pungent odor when the leaves are crushed. From the English ivy it is best distinguished by the flattened scale-like hairs (stellate and stalked in *H. Helix*).

A variegated clone, 'Variegata,' differs from the type only in the narrow marginal variegation of the leaves. It is not common.

5. Hedera Helix Linn. ENGLISH IVY.

This is the most widely distributed species of the genus and is widespread over most of western Europe. The typical form (var. Helix) and the var. hibernica are naturalized in wooded areas of Virginia and North Carolina. It is hardy in most parts of the United States, and its var. baltica is probably the most hardy of all the variants.

Typical Hedera Helix is distinguished from its varieties and clones by its juvenile foliage which is dark green in color with prominently whitish veins as seen from above, the leaves 1½ in. long or longer, 5-lobed, and the bases deeply cordate. The variant separated from it with the greatest difficulty is var. baltica, and the only reliable basis known to me is that in the typical form the stellate hairs are predominantly 4-6-rayed, while in var. baltica they are predominantly 8-rayed.

The key to varieties and clones given below is based on juvenile foliage. Except for var. *poetica*, none can be identified on the basis of adult foliage and reproductive structures.

THE VARIETIES AND CLONES OF HEDERA HELIX, THE ENGLISH IVY.

Variants of English ivy deserving of individual names probably number about sixty, and by some enthusiasts they are considered to number many more. In general, they fall into one of three clearcut groups, distinguished as follows:²

 Plant producing lateral branchlets prolifically, at least along the ends of the stems, in leaf axils.

Group I

Gro

Plants with lateral branchlets few, and never prolific in their production.

 Leaves uniformly green in summer (sometimes tinged reddish purple in winter if growing outdoors) Group II

A key, which is a device to assist one in identification of unknown plants is composed of a series of paired propositions. The statement of one proposition is, in general, the opposite of the other. The two propositions of a pair are identified by the same number. When using a key, have the specimen in hand and always read both propositions of a pair before deciding which is more closely matched by the specimen. Leaves variegated with white, or shades of yellow or yellowish-green, or uniformly whitish or yellowish throughout Group III

Group I was appropriately designated the Ramosa ivies by Alfred Bates. They are also known as the "self-branching" ivies. The original member of the group is 'Pittsburgh,' believed to be a derivative of *H. Helix* var. *hibernica* and was introduced sometime prior to 1920. These clones are budsports and highly unstable. The distinctions between them not only are slight but are inconstant. It is possible to propagate non-typical branches of a typical plant and produce one wholly unlike its "parent." Some of these clones have been patented. More alleged kinds are in the trade than are recognized here, and the omission of some from the key below reflects an inability to find bases for distinguishing them.

KEY TO THE CLONES OF THE RAMOSA GROUP (Group I) (Fig. 9)

 Leaves variously variegated white or ivoryyellow or marbled with varying shades of green.

Variegation of the leaves, mostly creamcolored or whitish, confined to the marginal areas.

 Variegation of a flecked pattern, the foliage primarily green and appearing spattered ivory cream and gray 1. cl. 'Ruth'

 Variegation of blotches, marbling or of major zonations.

Leaves mostly ½-1 inch long (an occasional leaf may be longer); green in mid-section, always 3-lobed.

2. cl. 'Silver King'
 Leaves mostly 1-21/2 inches long; graygreen, often marbled with green, in midsection, sometimes 5-lobed.

5. Edges of leaves usually reddish-purple. 3. cl. 'Pittsburgh Variegated'

5. Edge of leaves "white."

6. The "white" portion of leaves of much greater area than the "green."

6. The "white" portion of leaves narrow, and of less area than the "green." . . . 5. cl. 'Silver Emblem'

Variegation of the leaves formed by a marbling of the surface in shades of yellow-green, and at least a yellow-green area bordering the midrib, the margins green.

Petioles ¹/₄-³/₄ inch long, internodes of axillary shoots ¹/₄ inch long or less.

7. Petioles mostly 1 inch long or more, internodes of axillary shoots mostly 5/8-1 inch long 7. cl. 'Green Quartz'

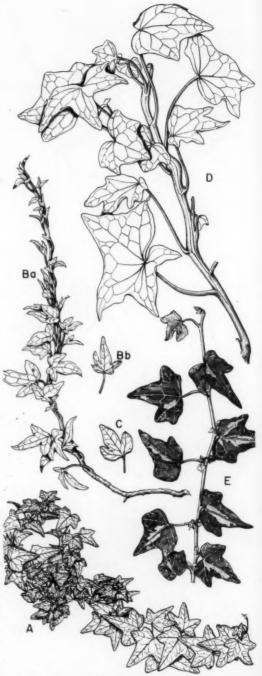


Fig. 9. Hedera Helix clones. A, 'Pittsburgh'. B, 'Meagheri': Ba, branch; Bb, leaf. C, leaf of 'Pin Oak'. D, 'Albany'. E, 'Green Quartz'. All x 1/2.

1. Leaves uniformly green, or only the veins of lighter color.

8. Twigs strongly fasciated (broadly flattened); leaves to $3\frac{1}{2}$ inches long (Fig. 9-D)

8. Twigs round to somewhat flattened (but not fasciated); leaves 2 inches long or less.

Terminal lobe of leaf broadest above the base.

 Leaves flat, not acutely concave above, mostly 3-lobed or entire.

9. Terminal lobe broadest at its base.

11. Leaves mostly 5-lobed.

13. Basal lobes never well developed.

13. cl. 'Maple Queen'13. Basal lobe, when leaf is 5-lobed, often angular and prominent.

 Leaves very strongly crisp-undulate or contorted.

.....16. cl. 'Holly'

The variegated Ramosa ivies fall into two types, those of "white" variegation (nos. 1-4) and those of "green" variegation. It is probable that "Pittsburgh Variegated' introduced by W. A. Manda. is the oldest, with 'Lee's Silver' next. A study of the plants would indicate that 'Silver King' and 'Silver Emblem' are derivatives of 'Lee's Silver' and that the distinction of each is to be maintained only by careful selection of propagating stocks. No differences have been noted between the so-called 'Jubilee' and 'Silver King,' although some plants of the former seem to be slightly more prolific in branching. All are slow growers, and probably 'Lee's Silver' is the slowest.

The variegation of 'Merion Beauty' and 'Green Quartz' is more conspicuous on foliage exposed to full sun than on that in partial shade. Well-grown plants often show three shades of marbling. The first is a sport of 'Pittsburgh,' and was introduced about 1937, the second is one of 'Pittsburgh Variegated,' and introduced a few years earlier. In 'Merion Beauty' the leaves of the older stems are green, marbled with lighter shades along the midrib and lateral veins. This pattern occurs also in 'Green Quartz' where the variegation is more yellowish

and the veins are even brighter yellow in the marbled zones.

All of the non-variegated clones of this complex are believed to be derivatives of 'Pittsburgh,' a clone introduced by Paul S. Randolph, of Verona, Pa., who had stocks of it on the market in 1920.

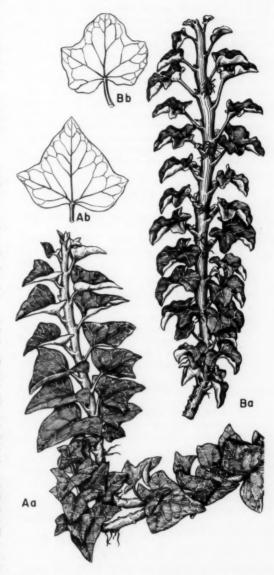


Fig. 10. Hedera Helix clones. A, 'Erecta': Aa, branch x ¼; Ab, leaf (flattened) x 1. B, 'Conglomerata': Ba, branch x ¼; Bb, leaf (flattened) x 1.

'Albany' was first propagated in 1931 and introduced in 1935 by Fred A. Danker, an Albany, N. Y. florist. 'Meagheri' (known also as 'Green Feather') was introduced by him about 1939. The clone 'Pin Oak' introduced by Henry Faust, Inc. of Merion, Pa., in 1941, differs from 'Meagheri' in the leaves flat and not trough-shaped, predominantly 3-lobed. In 1942 the same firm introduced another selection called 'Pin Oak Improved.' 'Hahn's Self-branching' was introduced by Sylvan Hahn in 1932 as a sport of 'Pittsburgh' and most of the material currently listed as the former is identifiable with the more prolific and smaller leaved 'Pittsburgh.' 'Sylvanian' (Plant Patent no. 430) was introduced by Sylvan Hahn in 1940, and is sometimes improperly designated 'Sylvan Beauty.'

Group II contains among others, all the older green-leaved clones of English ivy. It has the largest number of named kinds. In attempting to identify its members, be sure to refer to Group III any whose leaves are variegated yellowish-green to ivory-white, even if only a minority of the leaves

are so marked.

The clones of this group are distinguished as follows:

1. Habit of plant stiffly erect, the stems usually few, not flexuous. (Fig. 10)

2. Tips of leaves mostly acute . . 17. cl. 'Erecta'

2. Tips of leaves mostly rounded.

.....18. cl. 'Conglomerata' 1. Habit of plant trailing or climbing, the stems usually abundant and flexuous.

3. Leaves without lateral lobes, the basal lobes

conspicuous or not so. (Fig. 11)

- 4. Base of leaf deeply cordate, basal lobes often overlapping, upper surface of leaf dull.
 - 5. Terminal lobes rounded in most leaves of a twig19. cl. 'Deltoidea' 5. Terminal lobes acute in most leaves of a
- 4. Base of leaf truncate to cordate, basal lobes not overlapping, sometimes the basal lobes
- scarcely apparent, leaf apex acute or acuminate.
 - 6. Leaves glossy above when young, apices
 - 6. Leaves dull above when young, apices with convex margins.

7. The leaves 1-21/2 inches long.

7. The leaves ½-1 inch long.
.....23. cl. 'Scutifolia Minor'

3. Leaves mostly lobed laterally.

8. Terminal lobe about the same size as, or only slightly larger than, the lateral lobes, the leaf usually 5-7-lobed (if 3-lobed, see below in Second no. 8). (Fig. 12)



Fig. 11. Hedera Helix clones. A, 'Glymii'; B, 'Deltoidea'; C, 'Scutifolia'; D, 'Scutifolia Minor'. All x 1/2.



Fig. 12. Hedera Helix clones. A, 'Digitata'; B, 'Crenata'; C, 'Old Garden'. All x 1/2.

- 9. Leaf wavy or coarsely undulate; lobes often with 1-2 obtuse teeth along margin.24. cl. 'Crenata'
- 9. Leaf flat or somewhat concave from above, the margins not coarsely undulate (wavy); lobes usually without marginal
 - 10. Lobes usually 5 in number, the terminal one slightly longer and broader than the laterals, the sinuses about as wide as the lobes.
 - ... 25. cl. 'Palmata' 10. Lobes 5-7, of nearly equal length, the sinuses usually narrower than
 - 11. Leaves broader than long, the lobes short and abruptly acute.26. cl. 'Old Garden'
 - 11. Leaves as long as wide or longer, the lobes triangular-lanceolate or narrower. 27. cl. 'Digitata'
- 8. Terminal lobe markedly larger than the lateral lobes (often twice as long as wide or longer), the blade 3-5-lobed.
- 12. The leaf-blade strongly undulate, ruffled, or crispy-wavy.
 - 13. Leaves deeply lobed 28. cl. 'Fleur'
 - 29. cl. 'Curly Locks'
 - 30. cl. 'Manda's Crested' 31. cl. 'Telecurl' 32. cl. 'Williamsiana'
 - 13. Leaves scarcely or only shallowly lobed.
 - 33. cl. 'Parsley Crested'
 - 34. cl. 'Monstrosa'
 - 35. cl. 'Pixie'
 - 36. cl. 'Ripples'
- 12. The leaf-blade flat or only the margins un-
 - 14. The terminal lobe usually 2-4 times as long as wide, narrowly lanceolate. (Fig. 13)
 - 15. Leaves 3-5-lobed, terminal lobe broadest at base, without marginal teeth, dark bronzy green. . . . 37. cl. 'Minima'
 - 15. Leaves 5-lobed, terminal lobe usually broadest about 1/3 of its length above base, frequently with 1-2 marginal teeth, bright green. . . . 38. cl. 'Pedata'
 - 14. The terminal lobes rarely more than twice as long as wide, broadly lanceolate to triangular in form.
 - 16. Base of leaf deeply cordate with sides of lateral lobes usually overlapping, at least on most leaves. (Fig. 14)
 - 17. Midvein of uppermost lateral lobe forming a right or obtuse angle with leaf midrib; veins greenish-white.

 Midvein of uppermost lateral lobe usually forming an acute angle with midrib; veins whitish and with narrow whitish zone paralleling them.

16. Base of leaf rounded to cordate, lateral

lobes not overlapping. (Fig. 15)
18. Veins conspicuously whitish (actually greenish-white) on upper surface.

Leaves mostly less than 1 inch long. 41. cl. 'Walthamensis'

21. Hairs mostly with 4-6 rays.

18. Veins green on upper surface.

- Leaves large, predominantly 3-5½ inches across.
 - 24. Blades light green, often tinged reddish; terminal lobe much longer than broad.46. cl. 'Long Point'
 - 24. Blades dark green; terminal lobe as broad as long (or nearly so), the sides usually curved convexly.

25. Sinuses very shallow and wide.

25. Sinuses deep, narrowly acute.

23. Leaves small, predominantly 1½-3 inches wide.

26. Young leaves uniformly light greenishyellow, older ones green.
......49. cl. 'Russell Gold'

^a By recent international agreement, the epithets typica, genuina, etc., once used to designate the typical form of a species, have been discarded. It is now directed that the typical form be indicated by repeating the species epithet. Typical English ivy has the scientific name, Hedera Helix var. Helix.

The clone 'Long Point' originated at the W. A. Manda nurseries and was named by Alfred Bates, who placed it in the Ramosa Group (I). It is a derivative of 'Pittsburgh', but more often than not, it fails to show the precocious proliferating growth character of the Ramosa Group. Some plants of 'Pittsburgh' and of 'Hahn's Selfbranching' fail to show the proliferating habit, especially when grown outdoors, and may key out to 'Long Point' in this treatment.

26. Young leaves green.

27. Twigs brownish-purple; leaves thin, with purplish cast. ... 50. cl. 'Gracilis'

 Twigs green (except on sunny side); leaves thick, not purplish.

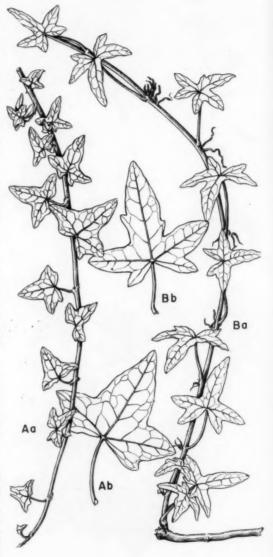


Fig. 13. Hedera Helix clones. A, 'Minima': Aa, branch x ½; Ab, leaf x 1. B, 'Pedata': Ba, branch x ½; Bb, leaf x 1.

28. Terminal lobes of most leaves slightly longer than wide, the basal and lateral lobes often united without an intervening sinus.

28. Terminal lobes of most leaves not longer than wide, the basal and lateral lobes usually separate and distinct.....52. cl. 'Emerald Gem'

Less is known about the origins of these varieties and clones than of those in Group I because, for the most part, these have been known for a century or longer. Most of them are of British origin and are described and figured in the writings of Shirley Hibberd and William Paul.

Two of the group are botanical varieties and, although generally propagated as clones, occur in the wild. The var. baltica, known as Baltic ivy, forms a ground cover in pine woods along the Baltic Sea. The var. hibernica, known as Irish ivy, is of less doubtful origin as a native of Ireland, but has been established in the woods of County Kerry since before 1836. It is one of the most commonly cultivated sorts in eastern United States, as concerns those used outdoors for ground covers and screens. It is readily distinguished by its large glossy 5-lobed leaves with green venation. It is a rapid and vigorous grower.

The erect shrubby clones known as 'Conglomerata' and 'Erecta' are very distinct. The largest seen by me was in California, where it stood 4 feet tall and wide. 'Conglomerata' appears to be of German origin (1870) and soon thereafter was introduced into England, where in 1871 it was referred to as "a new ivy named Hedera conglomerata." The clone 'Erecta' was recognized as distinct by Schulze in 1942 and passes in the trade as 'Conglomerata Erecta.' Both are very slow growers, probably the slowest of all ivies.

The clones with ruffled blades pose a nomenclatural problem. All seem to be of recent origin, and some have been derived from the usually precocious 'Holly.' That treated above as 'Monstrosa' by which name it has been known in Europe for perhaps 25 years is known also as 'Parsley Crested' and 'Parsley Curl.' The names 'Fleur,' 'Telecurl' and 'Manda's Crested' have been applied to clones of this group having a large terminal lobe and rather deep sinuses. In 'Manda's Crested' the leaves are coarsely wavy and not at all crisp-curly. 'Webers Californian' is even less strongly wavy. 'Williamsiana' has crisped-margined leaves, dark glossy green above with paler venation and a conspicuous narrow central lobe. Its origin is not not known to me.

The plant known as 'Russell Gold' is of English origin, introduced about 1934. In this clone the youngest leaves are distinctly yellowish-green (sap-

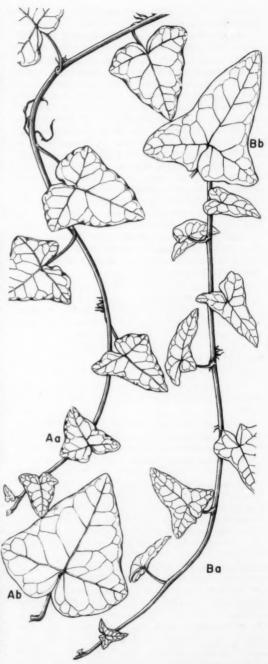


Fig. 14. Hedera Helix clones. A, 'Helvetica': Aa, branch × ½; Ab, leaf × 1. B, 'Sagittæfolia': Ba, branch × ½; Bb, leaf x 1.

green) and the older ones are bright green. The clone 'Smithii,' of recent introduction, is very similar, but is inferior as concerns extremes of foliage color. The clone 'Buttercup' is of this same alliance.

The other clones fall more or less into two groups: those with 3-lobed and those with 5-lobed leaves. The two most commonly grown are 'Glymii' and 'Scutifolia.' The second is variable in leaf form, with 5-lobed leaves as frequent as the 3-lobed. Cl. 'Deltoidea' is similar to both, but readily separated by the basal lobes of the leaves overlapping. Cl. 'Walthamensis' (known also as 'Minor') is the smallest leaved of the 5-lobed sorts and is a miniature form of typical English ivy, the two being distinctive by the white veins. The deeply lobed clones of 'Pedata' ('Birdsfoot,' 'Cænwoodiana'), 'Digitata,' 'Crenata,' and 'Minima' are unstable in leaf form, sometimes so much so that it is not possible to name a particular plant. This variability is more conspicuous among older outdoor plants than among pot subjects, where leaves of basal and lateral shoots are scarcely, if at all, distinguishable from those of typical English ivy.

There is in the trade a plant with small, dull dark green heart-shaped leaves, mostly ½-1 inch long, passing under the name *H. colchica minor*. The hairs, as well as leaf form and venation, place it in *Hedera Helix*. It is a diminutive form of 'Scutifolia,' differing only in the smaller leaves as noted in the key above. It appears to have no valid name and I here name it cl. 'Scutifolia Minor.'

The plant known in the trade as 'Bulgarian Ivy' appears to be indistinguishable from typical *Hedera Helix*.

Ivy clones with palmate or fan-shaped leaves are sometimes difficult to identify and name. One, with 5-7 shallow more or less equal lobes, and blades wider than long (see Fig. 12-C) has passed as 'Palmata' but is not that clone. Mr. Nilhaus Jensen, of the Copenhagen Botanic Garden, has given it the Danish name 'Den Gamle Have' of which the English equivalent is 'The Old Garden.' This Danish name is that of a well-known wholesale nursery and greenhouse situated at Frederiksdal pr. Lyngby—a surburb of Copenhagen. The variant occurs in variegated and non-variegated forms. It is here suggested that the name 'Old Garden' be used for the clone by English speaking people.

Group III is composed of those non-precocious clones whose leaves are variegated. It sometimes happens among individual plants that only a minority of the twigs, or of the leaves, show this variegation — a situation more common among older than younger specimens. The clones are considered to differ according to the characters of the following key. (Fig. 16)

 Leaves variegated "white" along margins (midsection may be mottled green and gray-green).

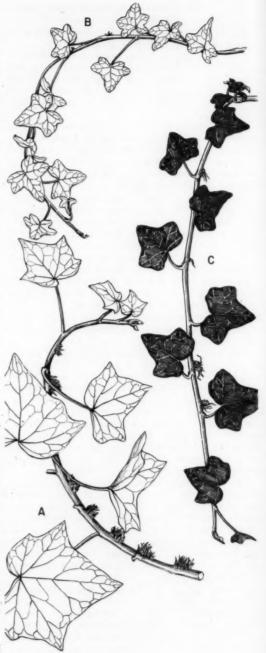


Fig. 15. Hedera Helix. A, var. Helix; B, var. hibernica; C, cl. 'Walthamensis'. All x ½.

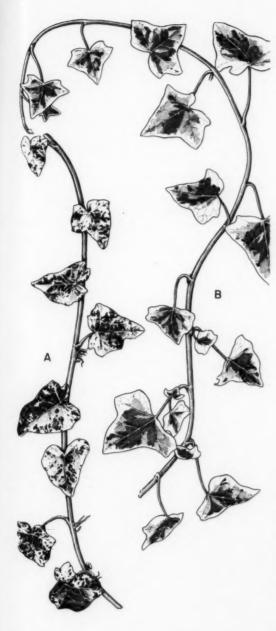


Fig. 16. Hedera Helix clones. A, 'Discolor'; B, 'Cavendishii'. Both x 1/2.

- 2. Variegation present in all seasons of the year.
- 2. Variegation consisting of an ivory-colored margin which during autumn and winter months (especially if grown outdoors) develops a purplish-red edge; petioles purplish-red (in autumn and winter).....54 cl. 'Tricolor'
- Leaves variegated "white" over most of surface, or at least not along margins only.
 - Variegation in form of small spots, flecks, or streaks.
 - 4. Leaves large, mostly $2\frac{1}{2}$ -4 inches across, the terminal lobe as broad as long.
 - 4. Leaves small, mostly 3/4-2 inches across, the terminal lobe somewhat longer than broad
 - 5. Variegation in shades of ivory-white or pale cream-color.....56. cl. 'Discolor'
- Variegation in form of one or a few patches or distinct zones.
 - Leaves with yellowish-green area bordering midrib, the rest of the leaf bright to dark green
 - 7. Petioles 1/4-3/4 inch long, internodes of axillary shoots to 1/4 inch long
 - 59. cl. 'Green Quartz'
 Leaves often entirely variegated when young or with many blotches.

The plants characterized by the "white-margined" leaves are treated here as belonging to the cv. 'Cavendishii.' Because it is highly improbable that all came from a single "ancestral" stock plant, it is improbable that they are propagules of a single clone. Plants in the trade under the names 'Glacier,' Silver Emblem,' and 'Silver Garland' are included here for lack of any apparent distinguishing characters, although in 'Silver Garland' the greens appear to be brighter than in 'Silver Emblem.' This is the plant Rehder designated var. variegata in his Manual.

Those plants with leaves flecked ivory-white or cream-color are usually 'Discolor' ('Marmorata'). The cl. 'Maculata' differs primarily in the longer and narrower terminal lobe. When grown in the open both clones are inclined to revert to the green-leaved type with the number of variegated leaves often reduced to a small minority.

ARBORETUM ACTIVITIES

(Continued from page 18)

a few of the Kurume group. Against a background of conifers these fine azaleas should be seen to good advantage.

WISTERIA WALK

A new walk has been established leading from the Rose Garden down to the Lower Nursery, thus giving access to a section of the Arboretum seldom seen by visitors. Here, on a double row of black locust posts, has been planted a choice collection of Chinese and Japanese wisterias which have been held in the slat-house for several years. Altogether about 20 interesting varieties are included in this planting. This new allée is expected to produce a considerable effect this season and should become increasingly attractive as these plants mature.

THE SUMMER COURSE

The Bulletin in its issue for September 1955 carried an account of the course in Woody Ornamentals which was offered at the Arboretum during the summer of 1955. The purpose of this course was to familiarize students with the rich variety of native and exotic trees and shrubs represented in the collections of the Arboretum.

Since there is a continuing demand for this type of instruction, the course will be offered again this coming summer through the auspices of the Summer School of the University of Pennsylvania. It will begin on Monday June 25 and terminate on Saturday, August 4. Anyone interested in this program should communicate with the Director of the Summer School, 116 College Hall, University of Pennsylvania, Philadelphia 4, Pa.

RECREATION AREA

As was the case last summer, the newly established Recreation Area, with facilities for picnics and outdoor games, will again be available without charge on an appointment basis. Although primarily intended for use by student groups from the campus, it may be used by other organizations who will submit their requests to the Dean of Student Affairs, Logan Hall, 36th and Woodland Avenue, Philadelphia 4.

J. M. F., Jr.

Library Accessions

The following volumes have recently been added to the Arboretum Library:

Climbing Roses, Helen VanPelt (M. Barrows & Co., 1955)

Shade Tree Pruning, A. Robert Thompson (Tree Preservation Bulletin No. 4, U.S. Dept. of the Interior)

Rope Knots and Climbing, A. Robert Thompson (Tree Preservation Bulletin No. 7, U. S. Dept. of the Interior)

Landscaping Your Own Home, Alice L. Dunstan (Macmillan, 1955)

Propagation of Horticultural Plants, G. W. Adriance and F. R. Brison (McGraw-Hill, 1955) Bonsai, Claude Chidamian (Van Nostrand, 1955)

Water, The Yearbook of Agriculture, 1955 Plant Propagation Practices, James S. Wells, Mac-

millan, 1955) The Arnold Arboretum Garden Book, Donald Wyman (Van Nostrand, 1954)

National Shade Tree Conference, 1954 (Collier Printing Co.)

The Genus Phlox, Edgar T. Wherry (Morris Arboretum Monograph No. III, 1955) American Men of Science, Vol. II, Biological

Sciences (The Science Press, 1955)

Small Home Landscaping, P. J. and A. B. Mc-Kenna (Arco Publishing Co., 1953)

Small-Fruit Culture, James S. Shoemaker (Mc-Graw-Hill, 1955)

Garden Design Illustrated, J. A. and C. L. Grant (Univ. of Washington Press, 1954)

Garden Spice and Wild Pot-Herbs, W. C. Muenscher and M. A. Rice (Comstock Publishing Associates, 1955)

Asiastic Magnolias in Cultivation, G. H. Johnstone (The Royal Horticultural Society, London, 1955)

*American Rock Gardens, Stephen F. Hamblin (Judd Publishing Co., 1929)

*Common Sense in the Rock Garden, James H. Bissland (A. T. de la Mare Co., 1938)

*The Rock Garden, Reginald Farrer (Frederick A. Stokes Co.) How to Grow Beautiful House Plants. Thomas

Everett (Arco Publishing Co., 1955)

Vascular Plants of Illinois, George N. Jones and George D. Fuller (Univ. of Illinois Press, 1955)

The Propagation of Alpines, Lawrence D. Hills (Faber and Faber, London)

Climates in Miniature, T. Bedford Franklin (Philosophical Library, Inc., 1955)

Lexicon Dendrologicum, Frans and Severin Amelinckx (De Sikkel, Antwerp, 1955)

Northern Rocky Mountain Trees and Shrubs, J. E. Kirkwood (Stanford University Press, 1930)

Peru History of Coca, W. Golden Mortimer (J. H. Vail & Co., 1901)

The Rhododendron and Camellia Year Book 1956 (Royal Horticultural Society, London)

How to Increase Plants, Alfred Carl Hottes (A. T. de la Mare Co., 1949)

* Gift of Edgar T. Wherry

this the nia. tate this eter-

abics out oriom ons of nd

ne ne ne on,

lin H.

as

il-

e-J.

J.

Γ.